REMARKS

Entry of the foregoing amendments, and reconsideration and reexamination of the subject application, as amended, are respectfully requested.

Amendments

Claim 1 has been amended to include essentially claim 9, directed to a fuel composition having both fuel and fuel additive. The first transitional phrase has been amended to "consisting essentially of" to exclude components in the cited art that would be detrimental to a liquid hydrocarbon fuel, such as the aqueous ingredients of El A'mma. The specification discloses "liquid hydrocarbon fuels" (e.g., page one, line nine) such as gasoline (Example 2), diesel (Example 1), and heating oil (page seven), and describes other "petroleum distillates" (application at page one) that are significantly different from the fermentation-derived "fusel oil" in the references which consists mainly of amyl alcohol. Further, the organic peroxide has been defined as "compatible" with the petroleum-based hydrocarbon fuel to distinguish the *hydro*peroxides in the art that would be compatible with fusel oil but not with gasoline (for example). The dependent claims have been amended accordingly.

New claim 15 is analogous to existing claims 10 and 11. New claims 16 and 17 are directed to the organic peroxides disclosed in the specification (*e.g.*, as supported at least at page five, ln. 20, and page six, ln. 17-18).

Claims 1 and 12 also have been amended to recite that the additive is present in an amount to improve combustion of the fuel, as suggested in the Office action.

Declaratory Evidence

Submitted herewith are the original declarations of Frank Norman and a copy of the declaration by Jamie Ryder previously submitted describing testing results using the instant composition that show at certain concentrations the unexpectedly improved combustion of two different types of petroleum-based liquid hydrocarbon fuels.

The Ryder declaration describes the use of the additive in combination with No. 6 heating oil for a high pressure industrial boiler. As described therein, amounts tested within the range of 1:891 and 1:1312 showed improved combustion of the fuel, evidenced by an improved Steam:Fuel ratio, whereas amounts of about 1:600 and of about 1:1900 showed a decreased Steam:Fuel ratio.

The Norman declaration includes a copy of a report by the University of Southern Main to Mr. Norman on testing of the additive in automobiles. The amount tested, 2 oz. in 10 gal., is 0.0015625, about the midpoint of the range now claimed (as in Example 2). The Norman declaration also avers that he supplied both of the testing facilities (Irving Tanning Co., where Mr. Ryder is employed, and the University) with the composition, and the specific composition of the additive supplied to both facilities. (It also explains that he owns the BORGASM registered trademark by which the University referred to the fuel additive tested.)

Rejection

The rejection states that the previous claim was examined as a composition, without weight given to the intended use, and that the claims were not directed to a method for improving combustion. Claim 12 as amended now specifically recites a method for improving combustion, and, as with claim 1 as

now amended, also requires that the additive be present in an amount relative to the amount of fuel effective to improve combustion of the fuel. None of the cited art describes that the amount of additive is important for achieving more efficient fuel use, nor suggests the unexpectedly improved results shown in the declarations.

The patentability of the claimed composition must be based not just on any similarity of the formulation in the prior art, but also the properties of the formulation. *In re Papesch*, 315 F.2d 381, 137 USPQ 43 (CCPA 1963). The enclosed article from Pall Corp. via the Internet (as reprinted from *Hydrocarbon Processing*) notes "a big problem" because "[w]ater concentrations as low as 100 ppm can cause off-specification due to haze, color or overall water concentration." Thus, liquid hydrocarbon fuels contain negligible, if any water. In contrast, Zhan is directed to *replacement* fuels that contain significant amounts of water; and El A'mma's compositions are for an aqueous environment. Hence, the "consisting essentially" language is intended to exclude water and essentially water-soluble (hydrophilic) compounds. The "amyl alcohol" forming most of the Zhan composition has significant solubility in water (and *vice versa*), which is why his compositions are disclosed as including both amyl alcohol and water.

The entire thrust of applicant's invention and disclosure is related to gasoline, diesel, heating fuels, and similar petroleum-based fuels and not the aqueous fermentation-based fusel oil compositions in the cited art, which in the respect of being aqueous, or having significant amounts of water, is now non-analogous art.

The rust and corrosion inhibitors of Gallacher are provided as spreadable compositions, because the carriers include mineral oil, mineral spirits, and waxes (bottom of column five), and the amount of carrier is less than about 50%

of the composition (col. 6, ln. 20-25; although the opposite is also disclosed). The Gallacher composition is applied to a metal surface (col. 3, ln. 63-64), not dissolved in a fuel composition. The Gallacher composition is applied to a metal surface and the surface then exposed to an environment normally sufficient to generate rust and corrosion. Thus, the Gallacher composition is designed to stay on the surface and be non-reactive *and*, being a rust inhibitor, is designed to work in an aqueous environment. The ingredients of the instant composition are intended to react, along with the fuel, to improve combustion in a non-aqueous environment. All of the testing examples in Gallacher involve subjecting the composition to elevated temperature (*e.g.*, 150°-200° C) and observing loss of sulfonate from the "painted" composition. While some of the possible carriers in Gallacher include materials, like kerosene, that can be used as fuels, no one would store a fuel like kerosene (or gasoline, or diesel) at such elevated temperatures. Gallacher is directed to applications such as lubricating oils and greases (col. 1, ln. 20-21), materials that function between wear parts, not to compositions that are combusted. Merely because Gallacher uses a *carrier* that could be (or is) used as a liquid hydrocarbon fuel does not provide motivation for using any of the compounds described therein as fuel additives. Accordingly, there is no motivation to use any of the compounds in Gallacher in a combusted fuel.

The abstract of Zhan is somewhat confusing, but does appear to disclose 0.1-3% peroxide, a range that the attached declaratory evidence shows actually makes combustion worse (although such a composition is still combustible). More importantly, Zhan discloses a fuel substitute because his compositions contain mostly fusel oil (essentially amyl alcohol) and 0.5-30% or 20-30% *water.* There is especially no disclosure of actually using gasoline (claim 10), diesel (claim 11), or heating oil (claim 15) as the principal hydrocarbon fuel. The Zhan

fuels are disclosed as useful for "gasoline and diesel engines" but not that the fuel contains any gasoline or diesel.

Still further, and consonant with the instant amendments, the peroxides in Zhan are hydroperoxides, as are those in El A'mma (col. 3, ln. 38). Hydroperoxides are not lipophilic and so would not be suitable for use in applicant's non-aqueous composition. It is inherent in Zhan, wherein the main component is water-soluble amyl alcohol, and significant amounts of water may be present (up to 30%), that a water-soluble hydroperoxide would be required to be compatible with the other components in the fuel. In contrast, it is inherent that applicant's peroxide is not a hydroperoxide and must be compatible with lipophilic constituents like gasoline, diesel, or fuel oil.

The statement in the rejection that "El A'mma is cited for teaching that the peroxides disclosed in Zhan are equivalent oxidants to those of the present invention" is seen as not rationally based on the respective disclosures, as El A'mma is directed to microbicides and Zhan is directed to fuel replacements. While the peroxide moiety is common, there is no disclosure or suggestion that a hydroperoxide useful for its microbicidal properties (El A'mma) in an aqueous solution would be useful for combustion in a fuel substitute (Zhan) (other than as a microbicide for the fuel). *In re Vaeck*, 947 F.2d 488, 493, 20 USPQ2d 1438, (Fed. Cir. 1991) (citing *In re Dow Chem. Co.*, 837 F.2d 469, 473, 5 USPQ2d 1529 (Fed. Cir. 1988)); both the suggestion and the reasonable expectation of success "must be founded in the prior art, not in the applicant's disclosure." The mere presence of a peroxide moiety is insufficient to warrant the combination, especially given that El A'mma's peroxides are hydroperoxides because they must be soluble in an aqueous environment. Thus, the presence of hydroperoxides in El A'mma and Zhan may counsel for those of El A'mma to be substituted into the Zhan compositions which contain hydrophilic constituents if

not also significant amounts of water, but as shown above, hydroperoxides are inherently unsuitable for the composition presently claimed.

In conclusion, the claims as amended clearly distinguish the cited art. The fuel consists essentially of a hydrocarbon fuel to avoid the presence of water, which is industry-recognized as a contaminant of the fuels disclosed in the specification, and by necessity the claimed peroxide and sulfonate must be soluble in such an environment for the additive to mix with the fuel. In light of the foregoing amendments and remarks, withdrawal of the rejections, and further and favorable action, in the form of a Notice of Allowance, is believed to be in order, and such actions are earnestly solicited.